

BENCHMARKS

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MAY 1982

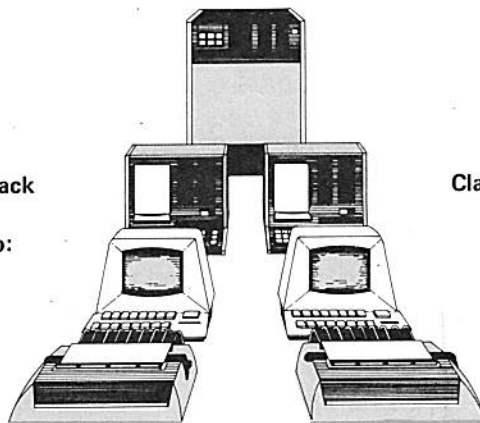
*BENCHMARKS was produced using MUSIC/SCRIPT

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BENCHMARKS Reader/User feedback
is encouraged.

Send all letters, suggestions, etc., to:
North Texas State University
The Computing Center
NT Station, Box 13495
Denton, Texas 76203



Claudia Putnam, BENCHMARKS Editor

Richard Harris,
Director of Computer Systems

Thomas Madron, Manager,
Academic Computing Services

SERVICES AVAILABLE TO USERS OF THE NTSU COMPUTING FACILITIES

All people mentioned below may be contacted by calling (817) 788-2324.

Information and Project Numbers - Sandy Franklin or Sue Heffley in the Computing Center Reception Area, ISB 119

Test Scoring and Analysis - Sue Heffley or Sandy Franklin

Newsletter Questions/Contributions/etc. - Claudia Putnam

Statistical/Research Support (provided for graduate students and faculty members) - Bob Brookshire, George Morrow, Claudia Putnam, and Mohamad Salahshour.

Non-Research Student Programming Problems - student consultants from the Computer Science Department found in ISB 134A near dispatch and the user keypunch area. Student consulting provided by the College of Business is available at the BA Computing Access Facility.

JCL and Debugging Problems - Mohamad Salahshour.

Pre-Research Counseling, Including Survey Instrument Design - Bob Brookshire, George Morrow, and Claudia Putnam.

Data Entry - to MUSIC, Keypunch Requests and Questions Regarding Layout of Keypunch Sheets - Betty Grise, ISB 227.

Academic Timesharing Information and/or Problems HP/2000 and AS/5000 MUSIC (McGill University System for Interactive Computing) information and problems, including terminal problems - Mohamad Salahshour.

Administrative Applications - Coy Hoggard.

AS/5000 Computer Hardware/Software/Billing Problems - Sandy Franklin.

JOB Submission and Retrieval - RJE operators.

SUMMER COMPUTING HOURS

Computing facilities will be open during the following times throughout the Summer Sessions (not applicable to holidays):

Computing Center RJE: 7 AM Monday to Midnight Saturday; Noon to Midnight Sunday.

College of Business RJE: 8:00 AM - Midnight, Monday - Saturday; Noon - Midnight Sunday.

Media Library(GAB): 8:00 AM to 10:00 PM Monday through Thursday;
8:00 AM to 6:00 PM Friday; 10:00 AM to 6:00 PM Saturday; 2:00 PM to 10:00 PM Sunday.

SEMESTER BREAK COMPUTING HOURS

The following facilities will be open during semester break (May 15-30):

Computing Center RJE

24 hrs - Monday - Friday
8 a.m. - 12 midnight Saturday
12 noon - 12 midnight Sunday

Media Library

9 a.m. - 5 p.m. Monday-Friday

The College of Business RJE will be CLOSED Noon Friday, May 14 until 8 a.m. Wednesday, June 2.

SUMMER WORKSHOPS AND SHORT COURSES

If you intend to use the Computing facilities for Research/Instructional or word processing projects, the Computing Center is offering the following short courses for your benefit.

The course schedule is as follows (rooms will be announced at a later date):

SUMMER I:

Introduction to MUSIC

Monday June 7, 1982, from 1-3 p.m.
Good for those who wish to learn the interactive computing system here at NTSU. INSTRUCTOR: Tom Madron.

Introduction to HP/2000

Monday June 7, 1982, from 3-5 p.m.
Provides a general introduction to the facilities available on the HP/2000 minicomputer.
INSTRUCTOR: Jeff Brooks.

Introduction to SPSS

Monday/Wednesday June 7/9, 1982, from 3-5 p.m. A general purpose statistical package especially good for social science data.
INSTRUCTOR: Bob Brookshire.

Introduction to BMDP

Tuesday/Thursday June 8/10, 1982, from 1-3 p.m. General purpose statistical package especially good for Analysis of Variance designs.
INSTRUCTOR: Bob Brookshire.

Introduction to SAS

Tuesday/Thursday June 8/10, 1982, from 3-5 p.m. General purpose statistical package with many other capabilities.
INSTRUCTOR: Claudia Putnam

Introduction to MUSIC/SCRIPT

Wednesday June 9, 1982, from 1-3 p.m.
Good for those who wish to utilize the computer to do word processing.
INSTRUCTOR: Claudia Putnam

Advanced Topics in MUSIC

Friday June 11, 1982 from 1-3 p.m.
Advanced usage of MUSIC NOT including MUSIC/SCRIPT.
INSTRUCTOR: Mohammad Salahshour

DUE TO THE NATIONAL COMPUTER
CONFERENCE, THE SUMMER I SEMINAR
DATES HAVE BEEN CHANGED TO THE
WEEK OF JUNE 14-18, SAME DAYS
AS ORIGINALLY SCHEDULED.

SUMMER II:

- Introduction to HP/2000 Monday July 26, 1982, from 1-3 p.m.
Provides a general introduction to
the facilities available on the
HP/2000 minicomputer.
INSTRUCTOR: Jeff Brooks.
- Introduction to BMDP Monday/Wednesday July 26/28, 1982, from
1-3 p.m. General purpose statistical
package especially good for Analysis
of Variance designs.
INSTRUCTOR: Bob Brookshire.
- Introduction to MUSIC Monday July 26, 1982, from 3-5 p.m.
Good for those who wish to learn the
interactive computing system here at
NTSU. INSTRUCTOR: Tom Madron.
- Introduction to SAS Tuesday/Thursday July 27/29, 1982, from
1-3 p.m. General purpose statistical
package with many other capabilities.
INSTRUCTOR: Claudia Putnam
- Introduction to SPSS Tuesday/Thursday July 27/29, 1982, from
3-5 p.m. A general purpose statistical
package especially good for social science
data. INSTRUCTOR: Bob Brookshire.
- Advanced Topics in MUSIC Wednesday July 28, 1982 from 3-5 p.m.
Advanced usage of MUSIC NOT including
MUSIC/SCRIPT.
INSTRUCTOR: Mohammad Salahshour
- Introduction to MUSIC/SCRIPT Friday July 29, 1982, from 10 a.m. - 12
noon. Good for those who wish to utilize
the computer do to word processing.
INSTRUCTOR: Claudia Putnam

A registration form is located at the back of this issue of BENCHMARKS and should be completed and returned AS SOON AS POSSIBLE if you wish to attend any of these sessions (copy the form and pass it on to a friend, if you like). If less than 5 participants sign up for a given session, the session will be cancelled and rescheduled. If you have further questions or suggestions, please call us at (817) 788-2324, or send MAIL to the SYSTEM (see the June 1981 BENCHMARKS or enter HELP MAIL while logged on to MUSIC for more information on sending MAIL).

USING THE COMPUTER FOR RESEARCH: PART III

By Bob Brookshire

This article is the third in a series of articles on computing and data analysis. The previous articles appeared in BENCHMARKS Volumes 3, ~~and~~ Numbers 2 and 3.

Data

Data Matrices

After the experiments have been completed, or the survey questionnaires have been returned, you are confronted with a mass of information that is to be analyzed. For most applications using computers, this information should be organized into a data matrix. In the data matrix, a set of symbols is used to represent the characteristics of the research subjects or other units of analysis. These symbols are often numbers, although they can be letters, words or names. The data matrix can be thought of as a rectangle made up of rows and columns of symbols, with each row or group of rows (contained on punched cards or records in a disk file) representing the characteristics of one research subject, or case. The columns, or groups of columns, in the matrix, contain individual characteristics, or variables. The following example may help to make the organization of a data matrix clearer.

The data matrix in Figure 1 represents the characteristics of a class of students. Each row in the matrix contains the information for one student, and each group of columns contains the information for one variable. The first variable, the student's name, is contained in columns 1 through 20. The second variable, the sex of the student, is located in column 21. Here the letters "M" and "F" stand for "male" and "female." The next set of columns, 23 and 24, contain a grade for one class exercise. Column 22 was left blank to make the data matrix more readable. Likewise, columns 26 and 27, and 29 and 30 contain grades for two additional class exercises, and columns 25 and 28 were left intentionally blank. Note that the information for each variable is positioned in the same columns for each student. Thus, if we can tell the computer program which columns each variable is in, it can keep track of the information for each case.

Figure 1

Data Matrix for a Class of Students

Anderson, Andrew	M	70	70	81
Binford, Bradley	M	94	74	92
Crandall, Cathy	F	84	64	84
Douglas, Dorothy	F	86	52	91
Evans, Ernest	M	88	66	87
Fowler, Franklin	M	96	92	96
Gordon, Gregory	M	96	80	86
Hatch, Heather	F	78	64	77

Figure 2 presents another, more compact format for presenting the same data. In this figure, the names are omitted, and a two digit identification number is assigned to each case. This variable is located in columns 1 and 2. Column 3 contains the sex variable, in this case coded 1 for males and 2 for females. Columns 4 through 9 contain the grades for the assignments, with two columns allocated for each assignment, and no spaces left between the variable locations. Although this format is a little more difficult for the human eye to read, it is easier for the computer to read, since it has no alphabetic symbols, and

would take less time to process, since the records are shorter.

Figure 2

Alternative Format for the Data Matrix for a Class of Students

```
011707081
021947492
032846484
042865291
051886687
061969296
071968086
082786477
```

The most common type of data matrix, then, is a matrix of order $n \times k$, where n is the number of cases and k is the number of variables. Other matrices are used in some applications, however, and it is to these that I will now direct your attention.

Some statistical programs use a data matrix of order $k \times k$, where both the rows and the columns refer to the same variables. An example of this type of matrix is a matrix of correlation coefficients, where each cell in the matrix represents the correlation between the variables corresponding to the row and column that define the cell. Figure 3 presents an example of this type of matrix.

Figure 3

Example of a Correlation Matrix for Seven Variables

```
1.00 0.87 0.78 0.73 0.62 0.50 0.49
0.87 1.00 0.25 0.71 0.60 0.10 0.69
0.78 0.25 1.00 0.74 0.35 0.76 0.67
0.73 0.71 0.74 1.00 0.58 0.68 0.59
0.62 0.60 0.35 0.58 1.00 0.66 0.92
0.50 0.10 0.76 0.68 0.66 1.00 0.01
0.49 0.69 0.67 0.59 0.92 0.01 1.00
```

The first entry, or cell, in the upper left corner of the matrix, contains the correlation between the first variable and itself, which is, of course, one. The cell in the first row, second column, is the correlation between variables one and two, in this instance .87. The correlation between the sixth variable and the third variable is found in the cell in the sixth row, third column, and so on. Note that the matrix is symmetric; that is, each row and column contains the same information as the corresponding column and row. The cell in row five, column four has the same value as the cell in row four, column five. The cell in row six, column two has the same value as the cell in row two, column six, etc.

Correlations are not the only possible entries in matrices of this

type. Data matrices of order $k \times k$ can also contain covariances, or other measures of similarity or dissimilarity, such as gamma. A familiar example of a matrix of this type is a table of distances between cities, as in Figure 4, which presents the distances between Atlanta, Chicago, Denver, Houston, Los Angeles, Miami, New York, San Francisco, Seattle, and Washington, D.C. The cell in column one, row one contains the distance between Atlanta and itself; row two, column one contains the distance between Atlanta and Chicago; row three, column four contains the distance between Houston and Denver, etc. In this matrix, however, the upper half has been omitted, since it is redundant with the lower half. This type of matrix is suitable for input to several statistical packages.

Figure 4

Lower Half Matrix of Distances Between Cities

0										
587	0									
1212	920	0								
701	940	879	0							
1936	1745	831	1374	0						
604	1188	1726	968	2339	0					
748	713	1631	1420	2451	1092	0				
2139	1858	949	1645	347	2594	2571	0			
2182	1737	1021	1891	959	2734	2408	678	0		
543	597	1494	1220	2300	923	205	2442	2329	0	

It is important to note the common features of all the data matrices presented so far. In all of these matrices, regardless of type, the information for each variable is presented in exactly the same columns. Note, too, that the information in each cell is right justified. That is, if the entry for that cell is not of the same length as other entries in its column, it is "padded" with blank spaces so that it occupies the correct position for its value. The names of the students in Figure 1 have been padded with blank spaces so that they all occupy 20 columns in the data matrix. The distances in Figure 4 have been similarly padded so that each entry takes up four columns. This padding preserves the relationships between the columns and the variables, so that when we tell the computer program in which columns a variable is located, it will associate those columns with that variable for each case, or row, in the data matrix.

Another type of data matrix is one which contains the cell entries from a crossclassification table. Figure 5 presents the data from a study of the 1980 presidential election, and shows the relationship between party affiliation and candidate choice for a national sample of adults.

Figure 5

Party Affiliation and Presidential Vote, 1980

Party Affiliation			
Vote	Democrat	Independent	Republican
Carter	288	83	12
Reagan	87	172	234

Source: Inter-University Consortium for Political & Social Research

Figure 6 shows two methods for presenting this tabular data for computer analysis. In method 1, the data are presented basically in the same format as the table in Figure 5. The columns represent the categories of party identification, and the rows represent the vote. In method 2, the first column of the matrix contains the number of the row, and the second column the number of the column, in which the data in the third column of the matrix is located in the table in Figure 5. For example, the number 288 is located in the first row, first column of the table, the number 83 is located in the first row, second column of the table, and so on. These methods of data presentation are especially useful for certain computer programs which calculate measures of association for 2 way or multiway tables, and perform log linear analysis. Some analysis of variance programs also require that data be presented in this fashion.

Figure 6

Two Methods for Presentation of Tabular Data

Method 1			Method 2		
288	83	12	1	1	288
87	172	234	1	2	83
			1	3	12
			2	1	87
			2	2	172
			2	3	234

These, then, are some of the types of data matrices used to prepare data for computer processing with statistical packages. As mentioned, the most common method is the $n \times k$ rectangular matrix, with each row (or group of rows) representing the data for one case, or unit of analysis. Most statistical packages have programs that will convert this type of data to matrices of other types. It is impossible to recover data for cases from $k \times k$ or tabular data matrices; therefore, most analysts prefer to start with the $n \times k$ matrix, which preserves the greatest amount of information that is present in the data. You must be aware of the data format which is required by the particular program you are using, and make sure that your data matrix is acceptable for use.

Data Coding and Entry

Once you have decided on the format of the data matrix, you need to make several additional decisions. The first is a decision on how the values of the variables are to be coded. For variables measured at the nominal level, numbers can be used to represent the names of the categories, as in Figure 2, where 1 stands for "male" and 2 stands for "female" as codes for the sex categories. Letters or words might also be used to identify the group memberships of units of analysis. The usual procedure, however, is to employ numeric values for categories, even though this makes little sense from a measurement perspective. There are two reasons for this practice. First, some statistical programs do not have the facility to read nonnumeric characters. These programs only accept numbers as values for variables. Second, computers operate much more efficiently with numeric data. Even if the statistical program, or package of programs, allows alphabetic or other nonnumeric values for variables, it is quicker and cheaper to process numbers. You should not fall into the trap of giving these codes metric interpretations, however. Remember that these numbers are merely symbols which stand for the names of the categories, and can rarely, if ever, be validly mathematically manipulated.

Variables measured at the ordinal level present a similar problem. Numeric values should be assigned to these categories, so that their relative ranking is preserved. Again, however, you should not read too much meaning into these values. Remember that the relative size of these numbers is arbitrary, because the distances between the ranks are undetermined. The numerical values only indicate the positions of the categories relative to each other, and you should be aware of the pitfalls involved in mathematical operations on ordinal variables.

Coding interval and ratio level variables is usually fairly straightforward. It is often not necessary to enter decimal points in data matrices, since many statistical programs will, as directed by their format statements, insert the decimal points as the values are processed. You should take note of the units in which their variables are measured (pounds, feet, atmospheres, etc.) to prevent confusion later.

The final step in coding the data seems obvious, but is sometimes overlooked by even veteran researchers: the construction of a codebook. As you decide on the proper codes for the values of categories, write them down along with the names of the variables with which they are associated. Note whether decimal points are included in the data or not, and where they should be placed if they are to be added by the program. You can pass this information on to the statistical program later, but between the coding of the data and the writing of the program commands, there is no record of what the data codes are if you don't make one.

A second decision that has to be made is what to do about missing data. Rarely will you be able to collect data on all variables for all the cases in your analysis. Some researchers prefer to throw out those cases for which data is not complete, but others, who may have hundreds of variables and a carefully drawn sample, find this tactic too costly. Rather, special codes are created to signify that the datum on this variable for this case is missing. Many statistical programs have procedures which automatically exclude cases which have missing values for variables in the current analysis, while retaining them for other analyses in which they have no missing data. The most common missing

value coding convention is a value which is completely out of the range of all the valid values. For instance, if the codes for sex are 1 for males and 2 for females, the value 9 might be used to represent a missing value. A missing value for age or weight might be 999, and so on. Sometimes, blanks are utilized to indicate missing values. Care should be used with this practice, since some statistical programs treat blanks as though they were zeros, and others do not allow blank values for variables. Other common coding conventions include using periods or ampersands to indicate missing values. Some programs accept these values, while others do not. You should check, in advance, the way in which missing values are treated in the programs you plan to use. A few programs allow no missing values at all.

A third decision that must be made is on the method used to enter the data onto its storage medium (storage media will be discussed below). At North Texas, two methods are available. Data may be entered at a terminal, either printing or video, which is connected to the main computer. In this case, the data can be stored directly on magnetic disk, or copied onto magnetic tape or cards. Data may also be punched on computer cards by a keypunch machine. In this case, the data may then be stored only on the cards, or copied onto magnetic tape or disk. The choice of one of these methods is primarily determined by the amount of data involved, and the method by which the statistical program will be accessed. If you are comfortable using punched cards, and plan to run your programs from cards, this method may be preferable. If the programs will be entered from terminals, perhaps the data should be entered in this way also. If quite a few cases are involved in the analysis (more than 100, for example), it may be most convenient to take advantage of the data entry services offered by the Computing Center. Trained operators will transcribe your data from paper coding sheets or properly prepared questionnaires to cards or disk for you.

Data Storage

How is the data matrix stored so that it can be accessed by the statistical program? As mentioned above, there are three basic methods of data storage: magnetic tape, magnetic disk, and punched cards. Magnetic tape, which is similar to the tape used in home tape recorders, is best suited for data matrices which are very large, or are accessed infrequently. Every time a program which uses data on a magnetic tape is run, the computer operator is required to physically retrieve the tape from its storage rack and mount it on a tape drive machine which advances the tape so that it can be read by the program. There are only three tape drives available at the North Texas Computing Center, and if they are in use, your program must wait until one is available. The necessity for human intervention in data processing means that these programs usually take longer, and in some instances cost more than other programs which do not require the mounting of tapes. For these reasons, tape storage is recommended only for long term preservation of little used data, or for very large data sets (census data, for example).

A magnetic disk is a data storage device that resembles a stack of phonograph records. Each disk is capable of holding millions of data records. These disks are permanently linked to the computer, and so require no action by the computer operator in order to be accessed by an analysis program. Magnetic disk storage is suitable for data matrices of all sizes except very large, and are especially useful for data sets that are used frequently. It is not appropriate for long term storage of data or very large data sets, since these disks are shared by all the users of the computer, and courtesy requires that this resource not be

dominated by a few users. Consequently, the Computing Center staff routinely (once or twice a year) erases all the information from these disks that is not currently being used. The magnetic disk is probably the best medium for the storage of data for most people during the analysis phase of their projects. After the analysis is completed, the data can then be transferred to tape for permanent preservation, and the space occupied by the data on the disk can then be free for use by someone else.

The punched card is probably the most familiar data storage medium. We are all quite used to seeing the little cardboard cards that shouldn't be "folded, splindled or mutilated." These cards can be quite useful for fairly small data sets, and can be conveniently stored for long periods in desk drawers or filing cabinets. They are not recommended, however, for large data matrices or data that will be used frequently for many analyses. The fragility of cardboard means that the data might easily be damaged through tearing or overturned coffee cups. Unwieldy boxes of cards, or stacks of cards held together by rubber bands, are particularly liable to being dropped or scattered. If one or even several records are misplaced, their absence might not be noticed in the mass of cards used for analysis. In addition, the use of the keypunch machines which enter the data on the cards is a fairly tricky operation for untrained operators, and consequently prone to error. For these reasons, there is now a general trend among computer professionals away from the use of cards. Indeed, some computer installations do not have any facilities for using punched cards. If you plan to have your data punched on cards, it is recommended that you create a magnetic disk file which contains a copy of the cards, and that this file be the data set with which the analysis is carried out. The cards can then be used as a long term, permanent record of the data, rather than the storage medium for the analysis.

* * * * *

In these articles in "Benchmarks," I have briefly reviewed the entire research process, from problem formulation through data coding, entry and storage. For those who would like further information on the preparation of data for processing, the references at the end of this section contain chapters on this subject.

At this point, you are (theoretically) ready to begin your computer assisted data analysis. The next installment in this series of articles presents some basic information about what a computer is, how it operates, and how you can get access to the computing services provided at North Texas State University.

References

- Babbie, Earl R. The Practice of Social Research. Belmont, Cal.: Wadsworth, 1973.
- Hy, Ronn J. Using the Computer in the Social Sciences: A Nontechnical Approach. New York: Elsevier-North Holland, 1977.
- McGaw, Dickinson and Watson, George. Political and Social Inquiry. New York: John Wiley & Sons, 1976.

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MUSIC ID-CODES TO BE CANCELLED

All MUSIC ID-codes which have been assigned to students through courses for the Spring semester will be purged from the system May 28, 1982. Students will be responsible for copying their files for later reference. This can be accomplished by using the #EXCHANGE utility to copy the files to tape or disk, or using the PTPCH utility to get a printout of the files.

MICROCOMPUTER SOFTWARE ON MUSIC

INTRODUCTION

Because of the rapid growth in the use of microcomputers at NTSU we are providing a library of contributed programs and related documentation for your use. The library will continue to be built through the contributions of users of MUSIC--you may be among those contributors. If you have a program to contribute, please send a message, via MAIL, to SYSTEM, indicating your USER ID, and the name of the program. Any program you contribute should be your own or already in the public domain. It should not be one you have purchased from a Computer Store or other commercial enterprise. Likewise, these programs are available for your personal use, not for piracy and resale.

In a similar vein, any programs or other files on MICROLIB are made available for their educational and instructional value as well as the enjoyment of computer users at North Texas State University. Any programs or data are not warranted in any way by NTSU, by The Computing Center, or by Academic Computing. If the contributed programs do not work, or if help and assistance is needed, please call the contributor, not Academic Computing. Academic Computing will be happy to assist you in using MICROLIB, but cannot take responsibility for contributions made by others.

CONTRIBUTIONS

While this service is conceived primarily for microcomputer users, if you have written a program for MUSIC you would like to share with others, please let us know. In order to use this service effectively you must have terminal software capable of "uploading" and "downloading" files to and from MUSIC. If you have a BASIC program on an APPLE you would like to share, for example, you would first need to save a copy of your program as an ASCII file on your APPLE system. You would then enter your terminal program and dial MUSIC. At that point you would need to upload the program to your USER ID. Once that is accomplished, you would then send a MAIL message to SYSTEM and we will take care of the rest.

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If you wish to contribute a program, please make sure that you have placed comment statements at the beginning of the program in the following format:

Program name and purpose
Contributor's Name
Contributor's Address and Phone Number
Date Program was written (and/or last update)
Date of Contribution
Any operational notes required
Bibliographic citation if the program
has been published

In the case of compiled, machine language files, there is only one way such programs should be contributed. They should be in Intel's HEX format (either as the byproduct of compilation, usually on a CP/M system, or by UNLOADing a CP/M COM file). If you are using a TRS-80 with the ST80III communications program, ST80III comes with utilities to change CMD (the TRS-80 equivalent of the COM file) files to the Intel HEX format. In this event, you should also provide a DOC file with the information described above for each program contributed. On CP/M systems the HEX files can be turned back into COM files with the LOAD utility. COM files can be turned into HEX files with the UNLOAD utility (LOAD is a standard CP/M program, UNLOAD is from the CP/M Users Group Library and is included in this library).

Each program in the library has a three level name:

system.filename.filetype

"System" pertains to the type of system for which the program was written: CPM, TRS80, APPLE, MUSIC, etc. "Filename" is a simple name for the program of eight characters or less, beginning with an alphabetic character. "Filetype" is a three character sequence indicating the kind of file (BAS, for BASIC programs; DOC for Documentation; HEX, for HEX files; etc.). In order to determine whether there are any programs or files of interest to you, you can simply issue the MUSIC LIST command, as follows:

LIST MICROLIB.system

where "system" is a term as described above.

To get a list of the various systems for which some items may be available, issue the following MUSIC command:

LIST MICROLIB.SYSTEM <exactly those words>

This command will provide a correct list of applicable "systems". As of this writing the list is more a "wish" list for contributors than a list of real resources, although there are some files already on MICROLIB.

NOTES ON UPLOADING AND DOWNLOADING

In order to use MICROLIB you must be using a microcomputer as a "smart" terminal. That is, your communications equipment must have the capability for "uploading" and "downloading" files. This point has already been made, but cannot be forgotten. The general procedure for uploading from your micro to MUSIC is to load a file into your storage buffer on your micro. Go back to communications and invoke the MUSIC

EDITOR using EDIT or TEDIT commands. Wait for the word INPUT to appear, along with the first prompt (?). Use your microcomputer terminal program to start the sending of data. When all data have been sent, go back to communications and press your <ENTER> or <CARRIAGE RETURN> key. This will terminate the INPUT function and return you to EDIT. Save your file. In general, you will find it difficult to upload a program or file to MUSIC when any line exceeds 80 characters in length. You may have to edit some files before transmission.

In order to download a file from MICROLIB decide which file you wish to have. ReLOG to your User ID using a terminal class which will not generate the MORE message: /ID USERID;LA36. Issue the MUSIC command "LIST filename" but do not press <ENTER> or <CARRIAGE RETURN>. Open a memory buffer on your microcomputer. Go back to communications and press <ENTER> or <CARRIAGE RETURN>. MUSIC will now start listing the file specified by "filename". When the entire file has been listed, close your memory buffer and save the file to disk (or possibly tape) on your micro. The file you have saved on your micro will have, at the beginning and end, some extraneous lines (usually of MUSIC messages). You must now use a text editor to take those extra lines out. If you are using a TRS-80 with ST80III you can, instead, issue the command to MUSIC, ST80DOWNLOAD. A downloading program which asks for filename and record length will then open the micro's memory buffer automatically and close it automatically. As we receive requests, and as it is possible, we will provide similar programs for other microcomputer communications programs and systems.

WHEN ALL ELSE FAILS -

If you need further help in using the MUSIC MICROCOMPUTER SOFTWARE LIBRARY, use MAIL to send inquiries to SYSTEM or call Academic Computing at 817-788-2324. On-line help may be obtained by entering:

LIST MICROLIB.DOC

INDEX TO PAST ISSUES

In order to utilize BENCHMARKS to its fullest capacity and avoid redundancies, an index of previous issues containing information considered still pertinent to the NTSU Computing Center is included in each issue.

<u>SUBJECT</u>	<u>VOL/NO</u>	<u>MONTH/YEAR</u>	<u>PG</u>
1. ACADEMIC COMPUTING IN GENERAL			
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NTSU Computing Center General Equipment List	2/7	Nov/Dec/81	21
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Disk Data Set Naming Conventions	2/2	March/81	2
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Priority Setting for Batch Jobs	2/4	June/81	2
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Obtaining Help While Logged On To MUSIC	3/1	January/82	8
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CAT: An Additional Way to Browse Your Save Library Files	2/6	October/81	7
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Printing "Very,Very Small" Numbers	3/1	January/82/13	
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8. USAGE STATISTICS			
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#EXCHANGE: A New MUSIC Utility To Archive Save Library Files	2/6	October/81	8
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REGISTRATION FORM FOR COMPUTING CENTER SHORT COURSES

Please complete this form and return it AS SOON AS POSSIBLE if you wish to attend any of the short courses announced in this issue.

NAME : _____ DEPARTMENT: _____

PHONE : _____

I wish to attend :

Introduction to MUSIC _____ June 7, 1-3 p.m.

_____ July 26, 3-5 p.m.

Introduction to MUSIC/SCRIPT

_____ June 9, 1-3 p.m.

_____ July 30, 10 a.m.-12 noon

Introduction to SPSS _____ June 7/9, 3-5 p.m.

_____ July 27/29, 3-5 p.m.

Introduction to SAS _____ June 8/10, 3-5 p.m.

_____ July 27/29, 1-3 p.m.

Advanced MUSIC _____ June 11, 1-3 p.m.

_____ July 28, 3-5 p.m.

Introduction to BMDP _____ June 8/10, 1-3 p.m.

_____ July 26/28, 1-3 p.m.

Introduction to HP/2000

_____ June 7, 3-5 p.m.

_____ July 26, 1-3 p.m.

DUE TO THE NATIONAL COMPUTER
CONFERENCE, THE SUMMER I SEMINAR
DATES HAVE BEEN CHANGED TO THE
WEEK OF JUNE 14-18, SAME DAYS
AS ORIGINALLY SCHEDULED.

PLEASE RETURN TO:

Academic Computing Services
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NT Box 13495
North Texas State University
Denton, TX 76203

GET A "SUBSCRIPTION" TO BENCHMARKS

BENCHMARKS is a vital link between the NTSU Computing Center and the users of our facilities. It is important for all users of the computing facilities to maintain a file of these newsletters because they contain materials which will periodically update existing documents as well as information and suggestions on uses of OS-MVT, MUSIC, the HP-2000, and other resources available to NTSU students and faculty. To facilitate the dispersal of BENCHMARKS, *** FREE *** subscriptions are now available. To receive yours, send the following information to us either by "snail mail" (the post office or campus mail) or electronically, through the MAIL facility on MUSIC.

Name _____

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PLEASE GIVE A CAMPUS ADDRESS (NOT BOX) IF POSSIBLE - It's Cheaper !

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